

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:  
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Date of mailing  
(day/month/year) **01 MAR 2005**

Applicant's or agent's file reference

**FOR FURTHER ACTION**

See paragraph 2 below

7483-6USTURB

International application No.

International filing date (day/month/year)

Priority date (day/month/year)

PCT/US04/26480

16 August 2004 (16.08.2004)

14 August 2003 (14.08.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): C22F 1/043; C21D 6/04 and US Cl.: 148/577,549,698; 420/548

Applicant

U.S. TURBO, LLC

**ENTERED**  
2-17-05

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

#### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

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*J. Whitehead*  
*for*

**WRITTEN OPINION OF THE  
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**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. II Priority

1. ☐ The following document has not yet been furnished:

☐ copy of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority has been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☐ claims Nos. \_\_\_\_\_

because:

☐ the said international application, or the said claim Nos. \_\_\_\_\_ relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. \_\_\_\_\_ are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. \_\_\_\_\_

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.

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**Box No. IV Lack of unity of invention**

1. ☐ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
  - ☐ paid additional fees
  - ☐ paid additional fees under protest
  - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
  - ☐ complied with
  - ☐ not complied with for the following reasons:
4. Consequently, this opinion has been established in respect of the following parts of the international application:
  - ☐ all parts.
  - ☐ the parts relating to claims Nos. \_\_\_\_\_

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**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <u>1-30</u>	YES
	Claims <u>31-33</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-33</u>	NO
Industrial applicability (IA)	Claims <u>1-33</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and explanations:**

Claims 1, 2, 5-21, and 24-30 lack an inventive step under PCT Article 33(3) as being obvious over "Aluminum and Aluminum Alloys" p 88-90, 108-112, 309-311, 317-318, 328-330.

"Aluminum and Aluminum Alloys" teaches aluminum foundry alloys (including C355, 354, A354 p 89 Table 1) can be cast into a variety of different shapes (p88, etc). It is within the disclosure of "Aluminum and Aluminum Alloys" to cast said alloy into a compressor wheel mold or die. "Aluminum and Aluminum Alloys" specifies cooling to a cryogenic temper (after solution heating and quenching) delays the aging response (p 309-310). Therefore, artificial aging occurs after cooling (wherein aging takes place at 115-190°C for 5-48h, see p 311). Additionally, "Aluminum and Aluminum Alloys" teaches at p 318 that cycling aluminum alloys to cryogenic temperatures as low as -195 °C relieves residual stress in order to permit fabrication of a part (p318, 2<sup>nd</sup> column). Said alloys can be subjected to hot isostatic pressing in order to improve the fatigue life (p 109, 1<sup>st</sup> column, p 108 Fig. 8). "Aluminum and Aluminum Alloys" at Table 1b (p 330) teaches 3xx have good machinability in an aged hardened temper, wherein machinability is dependent on alloy and temper.

Claims 3 and 22 lack an inventive step under PCT Article 33(3) as being obvious over "Aluminum and Aluminum Alloys" in view of JP54-033815A (JP'815A). "Aluminum and Aluminum Alloys" does not teach said 3xx Al-Si casting alloy contains Li. However, JP'815 teaches 0.02-0.2% Li can be added to Al-Si-Cu casting alloys with 5.0-13% Si and 2.0-5.0% Cu. It would have been obvious to add Li to the 3xx series alloys taught by "Aluminum and Aluminum Alloys" because JP'815 teaches said addition is useful for providing high tensile strength Al-Si alloys.

Claims 4 and 23 lack an inventive step under PCT Article 33(3) as being obvious over "Aluminum and Aluminum Alloys" in view of Scott et al (US 4,975,243). "Aluminum and Aluminum Alloys" does not teach said 3xx Al-Si casting alloy contains Sc. However, Scott teaches that up to 0.3% Sc (column 2 line 1) can be added to Al-Si casting alloys in order to provide grain refinement and increasing strength (column 2 lines 17-22). It would have been obvious to add Sc to the 3xx series alloys taught by "Aluminum and Aluminum Alloys" because Scott teaches said addition is useful for providing a grain refined and high tensile strength Al-Si alloy.

Claims 31 and 33 lack novelty under PCT Article 33(2) as being anticipated by Scott et al (US 4,975,243). Scott teaches an Al-Si alloy with 9-14% Si, 1.5-6.0% Cu, 3-7% Ni, less than 0.3% Sc, balance aluminum (column 4 lines 26-31), which overlaps the presently claimed alloying ranges.

Claims 31-33 lack novelty under PCT Article 33(2) as being anticipated by JP 54-033815A (JP'815A). JP'815A teaches an Al-Si alloy with 2-5% Cu, 5-13% Si, 0.02-0.2% Li, balance aluminum (JP'815 columns 1 and 2), which overlaps the presently claimed alloying ranges.

Claims 1-33 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

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Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

Application No.  
Patent No.

Publication date  
(day/month/year)

Filing date  
(day/month/year)

Priority date (valid claim)  
(day/month/year)

2. Non-written disclosures (Rules 43bis.1 and 70.9)

Kind of non-written disclosure

Date of non-written disclosure  
(day/month/year)

Date of written disclosure referring to  
non-written disclosure  
(day/month/year)

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**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:



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**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made: